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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/710,269 | 06/30/2004 | Meng-Jen Wang | 11180-US-PA | 4268 |

31561 7590 09/07/2004

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

DUONG, THO V

ART UNIT PAPER NUMBER

3743

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/710,269

Applicant(s)

WANG, MENG-JEN

Examiner

Tho v Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of "end portions of the arcuate spring are bolted on the bottom surface of the heat spreader" and "a plurality of grooves are disposed on a periphery of the heat spreader, for end portions of the arcuate spring being locked into the grooves" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,5,7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Horvath (US 4,415,025). Horvath discloses (figures 1-3) a heat sink structure suitable for chip-packing unit comprising a heat spreader (16), having top surface and a bottom surface, the bottom surface suitable for covering over the chip-packaging unit (12); a plurality of heat dissipating fins (18) disposed on the top surface; and at least one arcuate spring (24) disposed on the bottom surface and fabricated along with the heat spreader, wherein end portions of the arcuate spring are welded or locked on the bottom surface of the heat spreader at (27), while a central area of the arcuate spring at (25) is further away from the bottom surface of the heat spreader and is in contact with a surface of the chip package unit.

Claims 1-2,4,5,7,12,13,15,16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Farnworth et al. (US 6,258,609). Farnworth discloses (figures 9A,9B, column 9, line 66- column 10, line 36 and column 8, lines 35-41) a chip-packing unit comprising a package baseboard (102) having a first surface and a second surface; a chip (24) disposed on the first surface of and is electronically connected to the base board via flip chip bonding; an element (104) which both functions as a retainer and a heat spreader, having top surface and a bottom surface, the bottom surface suitable for covering over the chip-packaging unit (24); at least one arcuate spring (122) disposed on the bottom surface and fabricated along with the heat spreader,

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wherein end portions of the arcuate spring are welded or locked on the bottom surface of the heat spreader at (132), while a central area of the arcuate spring is further away from the bottom surface of the heat spreader and is in contact with a surface of the chip package unit; a plurality of hooks (128) at one end of the heat spreader fixed on a periphery of the bottom surface of the heat spreader and at another end thereof extended to and clipped on the second surface of the package baseboard.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth in view of Cook et al. (US 6,229,706). Farnworth substantially discloses all of applicant claimed invention as discussed above except for the limitation that the spring attached to the heat spreader by peripheral grooves formed on the heat spreader. Cook discloses (figure 1 and column 3, lines 36-46) a retainer (10) for use in a heat dissipation device wherein a spring (14) is mounted on the body (12) of the retainer by grooves (40) of the retainer so that the spring can be removably installed on the retainer. Since Farnworth and Cook are both from the same field of endeavor or/and analogous art, it would have been obvious to one having ordinary skill

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in the art at the time the invention was made to use Cook's teaching in Farnworth's device for the purpose of enabling the spring to be removably installed on the retainer.

Claims 3, 9, 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth in view of Hinshaw et al. (US 5,464,054). Farnworth substantially disclose all of applicant claimed invention as discussed above except for the limitation that the heat spreader has fins on its top surface and the heat spreader is made of copper. Hinshaw discloses (figure 1 and column 2, lines 18-32) that it is well known to have a heat spreader (21) is made of a high thermal conductivity material such as copper for the purpose of enhancing the heat dissipating rate of the heat spreader and fins (23) formed on top surface of the heat spreader for the purpose of increasing the heat transfer surface area of the heat spreader. Since Farnworth and Hinshaw are from the same field of endeavor and/or analogous art, it has been held to be obvious to one having ordinary skill in the art at the time the invention was made to use Hinshaw's teaching in Farnworth's device for the purpose of increasing the heat transfer surface area and for enhancing the heat dissipating rate of the heat spreader.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth and Hinshaw as applied to claim 9 above, and further in view of Cook. Farnworth and Hinshaw substantially disclose all of applicant's claimed invention as discussed above except for the limitation that the spring attached to the heat spreader by peripheral grooves formed on the heat spreader. Cook discloses (figure 1 and column 3, lines 36-46) a retainer (10) for use in a heat dissipation device wherein a spring (14) is mounted on the body (12) of the retainer by grooves (40) of the retainer so that the spring can be removably installed on the retainer. Since Farnworth and Cook are both from the same field of endeavor or/and analogous art, it would

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have been obvious to one having ordinary skill in the art at the time the invention was made to use Cook's teaching in Farnworth's device for the purpose of enabling the spring to be removably installed on the retainer.

Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnworth in view of Kong (US 20030160336A1). Farnworth substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the spring is mounted on the heat spreader by bolting. Kong discloses (figure 2 and paragraph 41) a heat dissipation device that has a heat spreader (40) mounted on the heat source (30) through a spring (42) wherein the spring are mounted on bottom surface of the heat spreader by using screws (bolts) for the purpose of removably secured the spring on to the heat spreader. . Since Farnworth and Kong are both from the same field of endeavor or/and analogous art, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use Kong's teaching in Farnworth's device for the purpose of enabling the spring to be removably installed on the heat spreader.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Buckmann et al. (US 5,376,587) discloses a heat sink and a spring mounted on a heat source.

Lipschutz (US 4,442,450) discloses a cooling element for solder bonded semiconductor.

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Malhi et al. (US 5,088,190) discloses a spring disposed between a heat source and a heat sink.

Bellar et al. (US 5,270,902) discloses a heat transfer device for use with a heat sink.

Reynolds (US 5,206,792) discloses an attachment for contact heat sink with a chip.

Babarbi (US 6,559,665) discloses a heat sink having peripheral hooks to secure a chip package.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

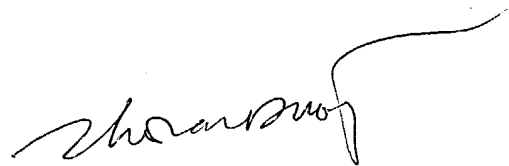
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.

TD

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August 30, 2004



Tho Duong

Patent Examiner